

Title (en)
TURBINE AIRFOIL WITH INDEPENDENT COOLING CIRCUIT FOR MID-BODY TEMPERATURE CONTROL

Title (de)
AERODYNAMISCHES PROFIL MIT UNABHÄNGIGEM KÜHLKREISLAUF ZUR STEUERUNG DER MITTELPROFILTEMPERATUR

Title (fr)
PROFIL AÉRODYNAMIQUE DE TURBINE AVEC CIRCUIT DE REFROIDISSEMENT INDÉPENDANT POUR CONTRÔLE DE LA TEMPÉRATURE À MI-PROFIL

Publication
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Application
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Priority
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Abstract (en)
[origin: WO2018022055A1] A turbine airfoil (10) includes an elongated hollow body (26) defining a radial cavity (T1, T2) positioned in an airfoil interior (11). A pair of radial flow passes (B,E/C,D) incorporating near-wall cooling (72, 74) channels are formed on opposite sides of the elongated hollow body (26), which are in serial flow relationship conducting a coolant in opposite radial directions, forming a serpentine cooling path (60a, 60b). A downstream radial flow pass (C, D) of the serpentine cooling path (60a, 60b) is fluidically connected to the radial cavity (T1, T2). Relatively heated coolant from the serpentine cooling path is directed into the radial cavity (T1, T2) to warm the elongated hollow body (26). The coolant is subsequently discharged via impingement openings (90) on the elongated hollow body (26) into first and second impingement volumes (102, 104) that respectively adjoin the pressure and suction side walls (16, 18). A temperature gradient between the elongated hollow body (26) and the outer wall (14) is thereby reduced.

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